Claims

1. A process for producing a catalyst for α-olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound and (3) a compound having a -C-O-C-O-C- bond group in a closed ring structure with one another.

2. The process for producing a catalyst for α-olefin polymerization according to Claim 1, wherein the solid catalyst component further has an organic acid ester or an ether.

3. The process for producing a catalyst for α-olefin polymerization according to Claim 1, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium tom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

4. A process for producing an α-olefin polymer, which comprises the step of homopolymerizing or copolymerizing an α-olefin in the presence of a catalyst for α-olefin polymerization produced by the process according to Claim 1.

5. A process for producing a catalyst for α-olefin

polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound, (3) a compound having a -C-O-C-O-C- bond group and (4) an alkoxysilicon compound with one another.

6. The process for producing a catalyst for α-olefin polymerization according to Claim 5, wherein the compound having a -C-O-C-O-C- bond group contains a compound having a -C-O-C-O-C- bond group in a closed ring structure.

7. The process for producing a catalyst for α-olefin polymerization according to Claim 5, wherein the solid catalyst component further has an organic acid ester or an ether.

8. The process for producing a catalyst for α-olefin polymerization according to Claim 5, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium tom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

9. A process for producing an α-olefin polymer, which comprises the step of homopolymerizing or copolymerizing an α-olefin in the presence of a catalyst for α-olefin polymerization produced by the process according to Claim 5.

10. A process for producing a catalyst for α-olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound, (3) a compound having a -C-O-C-O-C- bond group and (4) a 1,3-diether compound with one another.

11. The process for producing a catalyst for α-olefin polymerization according to Claim 10, wherein the compound having a -C-O-C-O-C- bond group contains a compound having a -C-O-C-O-C- bond group in a closed ring structure.

12. The process for producing a catalyst for α-olefin polymerization according to Claim 10, wherein the solid catalyst component further has an organic acid ester or an ether.

13. The process for producing a catalyst for α-olefin polymerization according to Claim 10, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium tom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

14. A process for producing an α-olefin polymer, which comprises the step of homopolymerizing or copolymerizing an α

-olefin in the presence of a catalyst for α-olefin polymerization produced by the process according to Claim 10.

15. A process for producing a catalyst for α-olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound, (3) a compound having a -C-O-C-O-C- bond group and (4) a piperidine compound with one another.

16. The process for producing a catalyst for α-olefin polymerization according to Claim 15, wherein the compound having a -C-O-C-O-C- bond group contains a compound having a -C-O-C-O-C- bond group in a closed ring structure.

17. The process for producing a catalyst for α-olefin polymerization according to Claim 15, wherein the solid catalyst component further has an organic acid ester or an ether.

18. The process for producing a catalyst for α-olefin polymerization according to Claim 15, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium tom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

19. A process for producing an α-olefin polymer, which comprises the step of homopolymerizing or copolymerizing an α-olefin in the presence of a catalyst for α-olefin polymerization produced by the process according to Claim 15.